Chapter 7
Grace Under Fire

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ABSTRACT

Participation in science, technology, engineering, and mathematics (STEM) professions have been historically dominated by white males in the United States with women, particularly minority women, remaining grossly underrepresented. In the United States and in most of the industrialized nations around the world, STEM majors and careers remain male-dominated despite ongoing efforts to change this reality. The study presented in this chapter explores the familial, educational, economic, and social experiences that are contributing to the selection and maintenance of a STEM career for 125 female participants. The grounded theory approach was used to develop an inductively derived grounded theory about the role these experiences played in the participants’ choosing and remaining in a STEM career. Study findings suggest that many of the macro-level initiatives aimed to increase the number of women who acquire a position in a STEM field are misaligned with the micro-level needs of the women in their academic progression as well as their needs once in a STEM profession.

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INTRODUCTION

The importance of recruiting and retaining women in science, technology, engineering, and mathematics (STEM) fields is pressing. The need for the United States to increase its production of highly educated workers STEM fields has been made clear in numerous recently released books and reports (e.g., Committee on Equal Opportunities in Science and Engineering 2004; National Science Foundation (NSF) 2006a, b; Southern Education Foundation, 2005; Wagner, 2008; and Bellanca, 2010). In fact, according to the Bureau of Labor & Statistics (2010), by 2018 computer & mathematical science occupations are projected to add 785,700 new jobs to the U.S. economy. Employment in these fields is projected to grow at double the rate of the average pace for all occupations. This projected demand for additional persons with STEM expertise, coupled with the expected retirement of many current STEM workers, makes efforts to promote the recruitment and retention of women and students from traditionally underrepresented groups particularly important (NSF 2006b; Southern Education Foundation 2005).

Amidst the largest number of women attending universities and colleges in the history of the United States, there continues to be a formidable disproportionate chasm between the number of women who earn STEM degrees and remain in STEM professions (Freeman, 2004). Sadly, educators, researchers and policymakers have been aware of this phenomenon for over the last 30 years and with the exception of few fields in science such as biology, little progress has been made in resolving the issue of the under-representation of women in STEM fields. “In scholarly discourse, the under-representation of women in science is often attributed to the shortage of women ‘in the pipeline’” (Polkowska, 2013, p.). In response to this widely accepted notion, a number of state and federal initiatives have been adopted to increase the number and achievement levels of female students enrolled in mathematics, science, engineering, and technology courses at the middle school, high school, and college level. Yet, despite the apparent successes of some of these initiatives, the under-representation on women in STEM fields persists. A recent study by researchers at the University of Texas at Austin found that females “are not avoiding STEM majors and professions because they lack academic preparation or sufficient skill” (Randall, 2013,) concluded
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